

What is claimed is

1. An electronic apparatus comprising  
a digital camera  
a fingerprint reading unit having a stamping area; and  
5 an optical system positioned in the fingerprint reading unit and comprising a lens  
additional to any lens incorporated in the digital camera,  
in which the fingerprint reading unit is operative to direct an image of an object on  
the stamping area through the lens system for capture by the digital camera.
- 10 2. The electronic apparatus of claim 1 in which the lens of the optical system has a  
configuration adapted to implement hyperopia correction to the image.
3. The electronic apparatus of claim 1 in which the stamping area comprises a  
semi-transparent film.
- 15 4. The electronics apparatus of claim 1 in which the fingerprint reading unit further  
comprises a source of light and a prism adapted to direct the light from the  
source onto the stamping area.
5. The electronics apparatus of claim 4 in which the fingerprint reading unit further  
comprises a light shield operative to block a peripheral portion of the light  
from the source from reaching the digital camera.
- 20 6. The electronics apparatus of claim 4 in which the source of light comprises a  
window adapted to admit external ambient light into the fingerprint reading  
unit.
7. The electronics apparatus of claim 4 in which the source of light is positioned  
within the fingerprint reading unit.

8. The electronics apparatus of claim 7 in which the source of light is activated when an object makes contact with the stamping area.
9. The electronics apparatus of claim 8 in which the source of light comprises a light-emitting polymer film which emits light in response to pressure from contact by an object against the polymer film.
10. The electronics apparatus of claim 1 in which the optical system further comprises a pinhole diaphragm positioned between the lens of the optical system and a lens of the digital camera.
11. The electronic apparatus of claim 1 in which the apparatus comprises a portable digital computer.
12. The electronic apparatus of claim 1 in which the apparatus comprises a wireless telephone.
13. A fingerprint reading and authentication method comprising the steps of providing an electronic apparatus comprising a digital camera, and a fingerprint reading unit having a stamping area, capturing into the digital camera a fingerprint image of a finger in contact with the stamping area, extracting information from the fingerprint image which uniquely characterizes the fingerprint image, comparing the information extracted which the fingerprint image to pre-registered fingerprint image data, authenticating whether the fingerprint image is the same as any image contained in the pre-registered fingerprint image data.

14. The fingerprint reading and authentication method of claim 13 in which the electronic apparatus further comprises a security system adapted to render the electronics apparatus inoperable when activated, and in which the method further comprises the step of activating the security system to bar access of a user of the electronics apparatus unless  
5 the authenticating step verifies that the fingerprint image is the same as an image contained in the pre-registered fingerprint image data.

15. The fingerprint reading and authentication method of claim 13 which further comprises the steps of  
10 correcting the fingerprint image obtained from the digital camera to remove distortion caused by optics of the digital camera, thereby forming a cleaned fingerprint image, and  
using the cleaned fingerprint image for extracting, comparing and authenticating with the pre-registered fingerprint image data.

16. The fingerprint reading and authentication method of claim 15 in which correcting the fingerprint image obtained from digital camera comprises (a) determining a Fourier transform function which characterizes the distortion between a precise image of a subject and an image of the subject produced by the digital camera, (b) applying an inverse Fourier transform process to the fingerprint image obtained from the digital  
15 camera using the Fourier transform function determined in step (a) to form the cleaned fingerprint image.  
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17. The fingerprint reading and authentication method of claim 15 in which the pre-registered fingerprint image data is obtained by an apparatus comprising  
a digital camera,  
25 a fingerprint reading unit having a stamping area; and an optical system positioned in the fingerprint reading unit, in which the fingerprint reading unit is operative to direct an image of an object on the stamping area through the optical system for capture by the digital camera, and in which the optical system comprises a lens adapted to implement

hyperopia correction to the fingerprint image, the lens being additional to any lens incorporated in the digital camera.